

June 3, 1998

INEEL COLD WASTE HANDLING SYSTEM

SPECIFICATIONS AND CAPABILITIES

The waste to energy system located at INTEC-653 consists of a Cooper Equipment Inc. model 96-500 cuber and associated storage, transfer and shredding equipment. The equipment is housed in an existing 100' x 50' building with a 40' x 50' receiving structure / annex added during installation of the project. The cuber operates off of a 250 horse power motor driving a 400,000 pound planetary gear system which extrudes the waste out through a series of cuber dies.

The system is normally staffed with 2 to 3 waste handling technicians (WHT's) trained and certified in cuber operation. Daily through put is in the 6000 to 8000 pound range depending on generation source and WHT availability. Assigning additional personnel increases daily through put by assisting in the sorting and handling required getting waste into the system. Two WHT's can effectively run the cuber system during cube production.

The system is totally dependent on hand sorting all non-combustibles out of the waste stream prior to shredding. The sorting consists of removing all metals, glass, potential hazardous materials/waste and any other items that either will not burn or are not desirable in the boilers or shredder. The level at which all items must be checked is very intensive to ensure that all items disposed of to the INEEL landfill meet the disposal requirements as stated in the Reusable Property, Recyclable Materials, and Waste Acceptance Criteria (RRWAC). Waste not acceptable for cubing is shredded, placed into separate containers and taken to the landfill.

The cubes in production now are produced using 96 double 7/8" square dies with a maximum output of 6 tons per hour. Average operations produce about 3 tons per hour. Alternative die sizes are 3/4" x 1", 1-1/8", and 1 1/4" square. The manufacture also has 7/8", 1" and 1-1/4" round dies and can supply a specialty die of 2-3/4" x 1-1/4".

The length, size and density of the cubes can be controlled to meet any requester specification. We have produced densities from 0.9 to 1.4 with coal at 1.2 as a reference. The weight per cubic foot of cubes can by design, range from 30 pounds per cubic foot to 48 pounds per cubic foot. Using coal as a reference, coal is about 50 pounds per cubic foot.

The operating system and method of handling

- ❑ Waste is delivered by landfill operations using a Dumpmaster overhead lift truck. The waste is pushed out the back of the truck to the receiving annex floor then visually surveyed for any immediately identifiable non-compliant items, which are, pull out of the pile and placed back on the truck.
- ❑ The waste is then hand carried by a WHT to the first infeed belt. If the waste is contained in a garbage bag, the plastic bag is broken open and spread out on the belt to allow for a more favorable geometry for the sorters. If not in a bag the waste is placed on to the belt with either a small front-end loader or shoveled on by hand.
- ❑ From the first infeed belt, the waste dumps on to the sorting table staffed by 1 or 2 WHT's and all non-compliant items are removed and placed into the hopper of an additional shredder for shredding and disposal to the CFA landfill.
- ❑ The sorted waste continues into a Shred-Pak model 80 industrial sheer type shredder. This unit is a low speed, high torque, 80 horsepower shredder (two 40 hp motors each driving one shaft) that has an operating volume of the same 6 tons per hour as the cuber.
- ❑ From the shredder, the waste enters a 10' x 10' x 50' meter box (MB-2) with a storage capacity of ~16,000 pounds. This method of storage is mandatory because of the volume of waste processed each day does not allow for an effective start of the cuber.
- ❑ Once the outside storage box is full, receiving operations are halted and a transfer operation begins to move the waste into the cuber meter box (MB-1). The route into the interior storage is through the first infeed belt, to the sorting table again and continues into the shredder. This route offers the system a "double" shred of the waste and gives us a smaller particle size of material, which is preferable to the cuber. This box has a ~6,000 pound capacity and when it is full, the cubing process is started. The control over the cubes is from the metering of waste out of MB-1 by speed control from the floor. With MB-1 controlling feed rates, MB-2 is keeping the feed stock storage full. Cubing operations will continue until all stored waste has been cubed and then the receiving/sorting operations begin again.
- ❑ The finished cubes are placed into a transport trailer and delivered out the Coal Fired Steam Generation Facility (CFSGF) by WHT's

UNIQUE SYSTEM CAPABILITIES

The cuber has four existing liquid injection ports located at the mixing auger, these consist of a volume low of 2.5 gallons per hour (gph) to a high of 22 gallons gph or any combination of the four for up to 60 ghp. The ports are currently supplied with water to assist in the compaction of our existing waste stream but can be modified to any liquid. Two additional ports are available and are not in service at this time. Current demand for water into the waste stream is about 2 to 3 gallons per hour.

Also attached to the mixer is a solids addition tank capable of a metered feed from 1 to 300 pounds per hour. These volumes depend on the density of the material being added. This tank proved very effective in the Dynamotive Bioline PEF production run.

There are many additional points of entry into the system with minor modifications, that will allow a wide variety of materials to be introduced at different locations i.e. in front of the shredding system, behind the shredder, directly into the mixing auger or directly into a storage/meter box. The ability to insert materials at any of these locations greatly enhances the opportunities to experiment with a wide variety of different type alternative feed stocks.

The availability of the wide range of die sizes is also an opportunity to custom build any size cube a requester might need. Keep in mind, we still have the original 1 1/4" size dies on hand and can be switched for the 7/8" dies within 2 to 3 days of maintenance work, but any of the others must be ordered and a cost of about \$10,000 per set not including installation.